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**(54) METHOD OF FORMING  
AMORPHOUS  
SEMICONDUCTOR THIN-  
FILM**

(57) Abstract:

**PURPOSE:** To improve stability to light irradiation remarkably by repeating the operation in which a semiconductor thin-film is formed onto a substrate by the thermal decomposition of a silane compound and the thin-film formed is exposed to the plasma of a non-depositing reactive compound gas.

CONSTITUTION: A silane compound as a raw material gas is shown by general formula  $\text{SiH}_{2n+2}$  (N represents a natural number), and monosilane, disilane and trisilane are particularly favorable on handling. Such a raw material gas is thermally decomposed, thus forming a semiconductor thin-film. A plasma treatment process in which a thin-film shaped is exposed to the plasma of a non-depositing reactive compound gas is executed successively. A specified film thickness is acquired by repeating the operation of film formation through thermal decomposition and the plasma treatment of the non-depositing gas, but it is desirable that the number of repetition is twice or more. The upper limit of the number of repetition is not limited particularly, but 1000 times or less, preferably 200 times or less are used.

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